

 Research Article

Digital Intelligence (DQ) as a Core Graduate Attribute in Higher Education

Leovigildo Lito D. Mallillin¹ , Sammy Q. Dolba² 

¹Research and Publication, University of Caloocan City, Caloocan City, Philippines

²College of Arts and Sciences, Arellano University, Manila, Philippines

Abstract

The study aims to identify Digital Intelligence (DQ) as a core graduate attribute in higher education institutions. It measures the level of integration of DQ in the institutional learning outcomes in terms of digital citizenship, digital creativity, digital critical thinking, digital communication, and digital safety and security. It also tries to analyze the level of students' DQ competency as perceived by students and faculty members. Purposive sampling is utilized in selecting the population and target sample size of the study, which comprised sixty-two (62) respondents only. Results show that the level of integration of DQ in institutional learning outcomes in terms of digital citizenship emphasizes responsible engagement of social media to promote academic policies, show that digital creativity encourages utilization of digital tools, show that digital critical thinking indicates students are being trained critically, show that digital information assesses capacity and ability to communicate effectively, and show that digital safety and security indicates policies are being promoted. On the other hand, the level of students' DQ competency as perceived by students and faculty members in terms of digital citizenship competency shows that respondents are aware on regulations and digital laws, shows that digital creativity competency indicates that students can content and create digital independently to solve academic issues in solving digital tools, shows that digital critical thinking competency indicates that students are critically evaluated the online sources to demonstrate digital research and logical reasoning, shows that digital communication competency indicates that students utilize appropriate language, and shows that digital safety and security competency indicates that student understand the digital setting privacy.

Keywords: Digital Intelligence, Core Graduate Attributes in Higher Education Institutions, Digital Intelligence Competency

✉ Correspondence

Leovigildo Lito D. Mallillin

leovigildomallillin@gmail.com

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1. INTRODUCTION

Digital Intelligence (DQ) is being increasingly recognized among core graduate attributes in Higher Education Institutions (HEIs). The focus has shifted from basic digital literacy to a set of technical, comprehensive, socio-emotional, and cognitive competencies. It enables graduates to navigate technology utilization responsibly, competently, and creatively to solve critical issues and complex gaps, and drive innovation in digital society readiness and implementation (Mallillin et al., 2020). It has become important in the integral part of the evolving digital world for living, communicating, and learning. It prepares the core graduate attributes in the 21st century with the fast-growing recognition of knowledge in the academe. It possesses the necessary skills, competencies, and values to navigate digital intelligence effectively and efficiently in adopting digital intelligence (Siripipattanakul et al., 2025). Digital intelligence is crucial, which goes beyond the core graduate attribute. It encompasses the necessary comprehensive set of cognitive, emotional, and social abilities in facing critical awareness, ethics, and confidence in the digital age. It demonstrates safety, critical thinking, and creativity to equip graduate students with digital intelligence exploration and integration of knowledge in learning in the HEIs (Mallillin et al., 2020). It shapes the key

dimensions for competent learning in the digital society. It prepares educators to navigate the rapidly evolving digital landscape in the educational system. It identifies continuous development, collaboration, personalization, adaptive approaches, ethical consideration, digital citizenship, authentic learning, and holistic integration. It integrates the basis for digital intelligence as a core graduate attribute in the HEIs' improved sustainable development goals in the educational system (Na, 2024).

Indeed, DQ as a core attribute in the HEI significantly contributes to the sustainable development goals and attainment in the educational system by equipping competency and thriving in the interconnected digital world. It encompasses online safety, digital communication, ethical awareness, critical thinking, and digital literacy, which are necessary in promoting equitable inclusivity for quality education for sustainable development goal innovation in the domain of learning (Mallillin, 2022). The ability to access digital intelligence to gain, synthesize, and analyze the vast amount of digital information to be an independent, informed decision-maker. It enhances support and lifelong learning privilege in the academic performance of graduate school students in HEI's necessary for sustainable development goals (Barnett-Itzhaki et al., 2025). Further, digital intelligence fosters creativity and innovation to empower students to develop real-world problems and technological solutions to social inequality, poverty, and environmental sustainability, contributing to the SDGs. DG strengthens the skills for employability among graduates to meet the demands of the digital workforce in support of the SDGs, to be more proficient, collaborative, and adaptable in digital tools in different professional settings. It promotes sustainable and responsible digital citizenship by instilling interactions, accountability, empathy, values, and respect. It is essential in building digital communities to be resilient and safe (Mallillin & Laurel, 2022). Hence, DQ integrates engagement by allowing students to participate in the collective effort in addressing the issues and global challenges. It is embedded in the curricula for DQ pedagogy, educational system, and institutional practices in enhancing the core attribute of HEI student competency to align with the principles of sustainable development goals (Dagur et al., 2026).

On the other hand, the key dimensions of digital intelligence as a core graduate attribute in higher education institutions endorse the framework in various competencies at the level of maturity, such as digital citizenship, which is focused on the ethical utilization of technology for safe and responsible cybersecurity and managing digital footprint (Mallillin, 2025). This includes digital creativity in content, creating new knowledge, and turning it into technology of ideas and realities. In addition to digital competitiveness in leveraging the innovation of digital tools for growth, the economy, and entrepreneurship. It continuously undergoes transformation in the educational setting and requires innovative services and adaptability. It structures rapid change and demands core attributes for students' needs necessary in the development of a competency-based model in education (Köpeczi-Bócz, 2025). Hence, the key dimensions of digital intelligence as a core graduate attribute in Higher Education Institutions require the skills for an efficient mechanism to reform the educational system to equip students with the trends of advanced technology and the needs of society. It enhances technology development to increase technical skills and a complex workforce, such as openness to innovation, problem-solving skills, and interdisciplinary thinking (Mallillin, 2024). It is crucial among HEIs to strengthen training to promote the program for competency development. It adapts the necessary skills in the transformation for the HEI to reform for strategic development, to demonstrate in terms of educational policy relevance. It transforms the structure of the educational system to respond to the changes and demands in the labor market. It challenges educational reform in the implementation of flexible education to maintain academic excellence. It integrates AI in the digital realm of leadership in the HEI for the operational and management of frameworks in the various school organizations (Ndjama & Van Der Westhuizen, 2025).

Moreover, the importance of DQ in higher education institutions is the readiness for employability and the workforce among the graduates. It reshapes the automation of job requirements into digital competency. It prepares the graduates to be adaptable and agile to new technologies in enhancing the skills of the labor market (Mallillin et al., 2024). This includes lifelong learning because it fosters an adaptation of continuous learning, allowing the graduates to shift with rapid technological changes. Graduates are ready to face digital issues and challenges, such as data privacy issues, cyberbullying, and misinformation (Mallillin & Dolba, 2026). Furthermore, cultivating digital intelligence in the curriculum requires shifting and integrating teaching and technical skills that embed with the foundation of competency, as well as cross-disciplinary integration in incorporating digital intelligence in various subjects for technical focus and practical application in applying the learning of digital in solving real-world gaps and challenges (Mallillin,

2025). It includes an assessment of digital skills that measures the implementation framework for digital competency in teaching and learning (Qian et al., 2025). Indeed, the challenges of digital intelligence in the implementation of teaching and learning in higher education institutions often face barriers in digital access for technology, speed of technical evolution, and the need for faculty professional development (Mallillin & Lopez, 2024). It is considered vital in the component of modern profiles of educational system graduates in ensuring proper technology skills, creative shapers, ethical, and active digital future (Manousou, 2025).

1.1. Statement of the Problem

What is the level of integration of DQ in institutional learning outcomes in terms of

- 1.1. digital citizenship,
- 1.2. digital creativity,
- 1.3. digital critical thinking,
- 1.4. digital communication, and digital safety and security?

What is the level of students' DQ competency as perceived by

- 1.1. students, and
- 1.2. faculty members?

Is there a significant relationship between the level of DQ integration in institutional learning outcomes and students' academic performance?

1.2. Hypothesis

There is no significant relationship between the level of DQ integration in institutional learning outcomes and students' academic performance.

1.3. Limitations of the Study

The study only covers the Digital Quotient as a core graduate attribute in higher education institutions, and it is limited to the level of integration of DQ in institutional learning outcomes in terms of digital citizenship, digital creativity, digital critical thinking, digital communication, and digital safety and security. This includes the level of students' DQ competency as perceived by students and faculty members only.

2. METHODOLOGY

2.1. Research Design

The study employs the descriptive quantitative research design because it quantifies the level of integration of DQ in institutional learning outcomes in terms of digital citizenship, digital creativity, digital critical thinking, digital communication, and digital safety and security. This includes the measures of the level of students' DQ competency as perceived by students and faculty members. Hence, the integration of digital intelligence evaluates the perspectives on the academic performance of students' learning process. It analyzes the impact of descriptive quantitative research design and AI's creative authenticity, quality, and efficiency. It indicates that digital intelligence transitioned to institutionalized and professional reality tools in teaching and learning. It indicates that the research design aligns with the present investigation's success and complementary approach in the integration of data analysis and curriculum process (Bakir, 2026).

2.2. Respondents of the Study

The subjects of the study are the students of the graduate school of Higher Education Institutions in the National Capital Region who attended the training and seminar workshop on quality assurance in private HEIs. The study comprised sixty-two (62) respondents, with 28 males and 34 females. The age range of the respondents falls between 40 and 53, as they are continually taking their graduate school program. The selection of the respondents is based on the criteria set by the researchers, which examines the impact of digital intelligence as a core attribute in the graduate school program based on digital experiences, academic background, and exposure to institutional DQ initiatives. This can maintain the ethical standard in the selection of the respondents to include consent, confidentiality, and voluntary participation (Al Rantisi & Koofan, 2026).

2.3. Sampling Technique

Purposive sampling is employed in the study because this kind of sampling is selective, subjective, and judgmental. It is a non-probability sampling utilized in the research process. It deliberately selects the respondents based on the specific experiences, knowledge, and characteristics that are relevant to the objectives of the study, which is based on the DQ exposure, background, and initiatives of the institutions. It focuses on obtaining in-depth, meaningful insight into obtaining a target population. Purposive sampling is effective in the focus of selecting the participants to provide the necessary information and resources. It remains valuable as a sampling technique to explore the complex educational phenomena of the defined context (Ahmed, 2024).

2.4. Test Instruments

The instrument tools utilized are based on the policy of the institutions where it is adopted in the graduate school program. This is being validated by experts in quantitative research methods. They are doctoral degree holders and psychometricians. All the suggestions and recommendations are being emphasized prior to the floating of the questionnaire. The tool is also pilot-tested on a group of 5 people to test the reliability and validity of the instruments using the Cronbach alpha. The result of the test is 0.82, which shows that the tool is valid for implementation.

3. RESULTS

On the level of integration of DQ in institutional learning outcomes in terms of digital citizenship, digital creativity, digital critical thinking, digital communication, and digital safety and security.

Table 1 presents the weighted mean and the corresponding interpretation of the level of integration of DQ in institutional learning outcomes in terms of digital citizenship among the respondents.

It shows in the table that rank 1 is “Institutional outcomes emphasize responsible social media engagement”, with a weighted mean of 4.23 or Highly Competent, which means that the level of integration outcome in terms of digital citizenship is highly observed. Rank 2 is “Academic policies promote respect and accountability in digital environments”, with a weighted mean of 4.00 or Competent, which means that the level of integration outcome in terms of digital citizenship is observed. Rank 3 is “The institution integrates responsible online behavior in its learning outcomes”, with a weighted mean of 3.89 or Competent, which means that the level of integration outcome in terms of digital citizenship is observed. The lowest rank is shared by the two indicators, which are “Courses include ethical use of digital resources” and “Students are guided on digital rights and responsibilities”, with a weighted mean of 3.38 or Moderately Competent, which means that the level of integration outcome in terms of digital citizenship is limited. The overall average weighted mean is 3.78 (SD=0.382), or Competent, in the level of integration outcome in terms of digital citizenship, which is observed among the respondents.

Table 1. The Level of Integration Outcome in Terms of Digital Citizenship

Indicators	Weighted Mean	Interpretation	Ranking
The institution integrates responsible online behavior in its learning outcomes.	3.89	C	3
Courses include ethical use of digital resources.	3.38	MC	4.5
Academic policies promote respect and accountability in digital environments.	4.00	C	2
Students are guided on digital rights and responsibilities.	3.38	MC	4.5
Institutional outcomes emphasize responsible social media engagement.	4.23	HC	1
Average Weighted Mean	3.78	C	
Standard Deviation	0.382		

Legend: HC=Highly Competent, C=Competent, MC=Moderately Competent

Table 2. The Level of Integration Outcome in Terms of Digital Creativity

Indicators	Weighted Mean	Interpretation	Ranking
The curriculum encourages innovative use of digital tools.	4.21	HC	1.5
Students are required to create digital projects (videos, multimedia, blogs, etc.).	3.37	MC	5
Learning outcomes promote creative problem-solving using technology.	4.04	C	3
Courses integrate design thinking through digital platforms.	3.78	C	4
Faculty incorporate digital production tools in assessments.	4.21	HC	1.5
Average Weighted Mean	3.92	C	
Standard Deviation	0.355		

Legend: HC=Highly Competent, C=Competent, MC=Moderately Competent

Table 2 presents the weighted mean and the corresponding interpretation of the level of integration of DQ in institutional learning outcomes in terms of digital creativity among the respondents.

It shows in the table that rank 1 is shared by the two indicators, which are “The curriculum encourages innovative use of digital tools” and “Faculty incorporate digital production tools in assessments”, with a weighted mean of 4.21 or Highly Competent, which means that the level of integration of DQ in institutional learning outcomes in terms of digital creativity is highly observed. Rank 2 is “Learning outcomes promote creative problem-solving using technology”, with a weighted mean of 4.04 or Competent, which means that the level of integration of DQ in institutional learning outcomes in terms of digital creativity is observed. Rank 3 is “Courses integrate design thinking through digital platforms”, with a weighted mean of 3.78 or Competent, which means that the level of integration of DQ in institutional learning outcomes in terms of digital creativity is observed. The lowest in rank is “Students are required to create digital projects (videos, multimedia, blogs, etc.)”, with a weighted mean of 3.37 or Moderately Competent, which means that the level of integration of DQ in institutional learning outcomes in terms of digital creativity is limited. The overall average weighted mean is 3.92 (SD=0.355), or Competent, indicating that the level of integration of DQ in institutional learning outcomes in terms of digital creativity is observed among the respondents.

Table 3. The Level of Integration Outcome in Terms of Digital Critical Thinking

Indicators	Weighted Mean	Interpretation	Ranking
Students are trained to evaluate online information critically.	4.22	HC	1
The curriculum promotes fact-checking and source validation.	3.84	C	4
Learning outcomes include data analysis using digital tools.	3.96	C	3
Students are guided to identify misinformation and fake news.	3.36	MC	5
Courses develop ethical reasoning in digital contexts.	4.12	C	2
Average Weighted Mean	3.90	C	
Standard Deviation	0.335		

Legend: HC=Highly Competent, C=Competent, MC=Moderately Competent

Table 3 presents the weighted mean and the corresponding interpretation of the level of integration of DQ in institutional learning outcomes in terms of digital critical thinking among the respondents.

It shows in the table that rank 1 is “Students are trained to evaluate online information critically”, with a weighted mean of 4.22 or Highly Competent, which means that the level of integration of DQ in institutional learning outcomes in terms of digital critical thinking is highly observed. Rank 2 is “Courses develop ethical reasoning in digital contexts”, with a weighted mean of 4.12 or Competent, which means that the level of integration of DQ in institutional learning outcomes in terms of digital critical thinking is observed. Rank 3 is “Learning outcomes include data analysis using digital tools”, with a weighted mean of 3.96 or Competent, which means that the level of integration of DQ in institutional learning outcomes in terms of digital critical thinking is observed. The lowest in rank is “Students are guided to identify misinformation and fake news”, with a weighted mean of 3.36 or Moderately Competent, which means that the level of integration of DQ in institutional learning outcomes in terms of digital critical thinking is limited. The overall average weighted mean is 3.90 (SD=0.335), or Competent, indicating that the level of integration of DQ in institutional learning outcomes in terms of digital critical thinking is observed among the respondents.

Table 4. The Level of Integration Outcome in Terms of Digital Communication

Indicators	Weighted Mean	Interpretation	Ranking
The institution promotes professional digital communication skills.	4.04	C	2
Students are trained in collaborative digital platforms (LMS, video conferencing).	3.37	MC	5
Courses require online discussions and presentations.	3.76	C	4
Learning outcomes emphasize digital etiquette.	3.88	C	3
Students are assessed on their ability to communicate effectively online.	4.20	HC	1
Average Weighted Mean	3.85	C	
Standard Deviation	0.315		

Legend: HC=Highly Competent, C=Competent, MC=Moderately Competent

Table 4 presents the weighted mean and the corresponding interpretation of the level of integration of DQ in institutional learning outcomes in terms of digital communication among the respondents.

It shows in the table that rank 1 is “Students are assessed on their ability to communicate effectively online”, with a weighted mean of 4.20 or Highly Competent, which means that the level of integration of DQ in institutional learning outcomes in terms of digital communication is highly observed. Rank 2 is “The institution promotes professional digital communication skills”, with a weighted mean of 4.04 or Competent, which means that the level of integration of DQ in institutional learning outcomes in terms of digital communication is observed. Rank 3 is “Learning outcomes emphasize digital etiquette”, with a weighted mean of 3.88 or Competent, which means that the level of integration of DQ in institutional learning outcomes in terms of digital communication is observed. The least in rank is “Students are trained in collaborative digital platforms (LMS, video conferencing)”, with a weighted mean of 3.37 or Moderately Competent, which means that the level of integration of DQ in institutional learning outcomes in terms of digital communication is limited. The overall average weighted mean is 3.85 (SD=0.315) or Competent, indicating that the level of integration of DQ in institutional learning outcomes in terms of digital communication is observed among the respondents.

Table 5 presents the weighted mean and the corresponding interpretation of the level of integration of DQ in institutional learning outcomes in terms of digital safety and security among the respondents.

The table shows that rank 1 is “Policies promote safe and secure digital learning environments”, with a weighted mean of 4.21 or Highly Competent, which means that the level of integration of DQ in institutional learning outcomes in terms of digital safety and security is highly observed. Rank 2 is “The institution integrates cybersecurity awareness into its curriculum”, with a weighted mean of 4.11 or Competent, which means that the level of integration of DQ in institutional learning outcomes in terms of digital safety and security is observed. Rank 3 is “Students are taught how to protect personal data online”, with a weighted mean of 3.91 or Competent, which means that the level of integration of DQ in institutional learning outcomes in terms of digital safety and security is observed. The lowest in rank is “Students are

trained to recognize phishing, scams, and cyber threats”, with a weighted mean of 3.37 or Moderately Competent, which means that the level of integration of DQ in institutional learning outcomes in terms of digital safety and security is limited. The overall average weighted mean of 3.89 (SD=0.325) or Competent in the level of integration of DQ in institutional learning outcomes in terms of digital safety and security is observed among the respondents.

Table 5. The Level of Integration Outcome in Terms of Digital Safety and Security

Indicators	Weighted Mean	Interpretation	Ranking
Students are taught how to protect personal data online.	3.91	C	3
The institution integrates cybersecurity awareness into its curriculum.	4.11	C	2
Learning outcomes include safe digital practices.	3.85	C	4
Students are trained to recognize phishing, scams, and cyber threats.	3.37	MC	5
Policies promote safe and secure digital learning environments.	4.21	HC	1
Average Weighted Mean	3.89	C	
Standard Deviation	0.325		

Legend: HC=Highly Competent, C=Competent, MC=Moderately Competent

Table 6 presents the weighted mean and the corresponding interpretation of the level of students’ DQ competency as perceived by students and faculty members in terms of digital citizenship competency among the respondents.

Table 6. The Level of Students’ DQ Competency As Perceived by Students and Faculty in Terms of Digital Citizenship Competency

Indicators	Weighted Mean	Interpretation	Ranking
Students demonstrate responsible behavior online.	3.86	C	3
Students respect intellectual property rights.	3.36	MC	5
Students practice ethical digital conduct.	3.74	C	4
Students show awareness of digital laws and regulations.	4.24	HC	1
Students engage positively in online communities.	4.00	C	2
Average Weighted Mean	3.84	C	
Standard Deviation	0.326		

Legend: HC=Highly Competent, C=Competent, MC=Moderately Competent

It shows in the table that rank 1 is “Students show awareness of digital laws and regulations”, with a weighted mean of 4.24 or Highly Competent, which means that the level of students’ DQ competency as perceived by students and faculty members in terms of digital citizenship competency is highly observed. Rank 2 is “Students engage positively in online communities”, with a weighted mean of 4.00 or Competent, which means that the level of students’ DQ competency as perceived by students and faculty members in terms of digital citizenship competency is observed. Rank 3 is “Students demonstrate responsible behavior online”, with a weighted mean of 3.86 or Competent, which means that the level of students’ DQ competency as perceived by students and faculty members in terms of digital citizenship competency is observed. The lowest in rank is “Students respect intellectual property rights”, with a weighted mean of 3.36 or Moderately Competent, which means that the level of students’ DQ competency, as perceived by students and faculty members in terms of digital citizenship competency, is limited. The overall average weighted mean is 3.84 (SD=0.326), or Competent, indicating that the level of students’ DQ competency as perceived by students and faculty members in terms of digital citizenship competency is observed among the respondents.

Table 7 presents the weighted mean and the corresponding interpretation of the level of students’ DQ competency as perceived by students and faculty members in terms of digital creativity competency among the respondents.

It shows in the table that rank 1 is “Students can create digital content independently”, with a weighted mean of 4.23 or Highly Competent, which means that the level of students’ DQ competency as perceived by students and faculty members in terms of digital creativity competency is highly observed.

Rank 2 is “Students adapt digital tools to solve academic problems”, with a weighted mean of 4.11 or Competent, which means that the level of students’ DQ competency as perceived by students and faculty members in terms of digital creativity competency is observed. Rank 3 is “Students use technology innovatively in projects”, with a weighted mean of 3.97 or Competent, which means that the level of students’ DQ competency as perceived by students and faculty members in terms of digital creativity competency is observed. The lowest in ranks is “Students apply design and creativity in digital tasks”, with a weighted mean of 3.35 or Moderately Competent, which means that the level of students’ DQ competency, as perceived by students and faculty members in terms of digital creativity competency, is limited. The overall average weighted mean is 3.89 (SD=0.345), or Competent, in the level of students’ DQ competency as perceived by students and faculty members, in terms of digital creativity competency, is observed among the respondents.

Table 7. The Level of Students’ DQ Competency As Perceived by Students and Faculty in Terms of Digital Creativity Competency

Indicators	Weighted Mean	Interpretation	Ranking
Students can create digital content independently.	4.23	HC	1
Students use technology innovatively in projects.	3.97	H	3
Students integrate multimedia tools effectively.	3.77	H	4
Students apply design and creativity in digital tasks.	3.35	MC	5
Students adapt digital tools to solve academic problems.	4.11	C	2
Average Weighted Mean	3.89	C	
Standard Deviation	0.345		

Legend: HC=Highly Competent, C=Competent, MC=Moderately Competent

Table 8 presents the weighted mean and the corresponding interpretation of the level of students’ DQ competency as perceived by students and faculty members in terms of digital critical thinking competency among the respondents.

Table 8. The Level of Students’ DQ Competency As Perceived by Students and Faculty in Terms of Digital Critical Thinking Competency

Indicators	Weighted Mean	Interpretation	Ranking
Students critically evaluate online sources.	4.21	HC	1
Students can distinguish credible from unreliable information.	3.35	MC	5
Students analyze digital data effectively.	3.87	C	3
Students avoid spreading misinformation.	3.71	C	4
Students demonstrate logical reasoning in digital research.	4.01	C	2
Average Weighted Mean	3.83	C	
Standard Deviation	0.325		

Legend: HC=Highly Competent, C=Competent, MC=Moderately Competent

It shows that rank 1 is “Students critically evaluate online sources”, with a weighted mean of 4.21 or Highly Competent, which means that the level of students’ DQ competency as perceived by students and faculty members in terms of digital critical thinking competency is highly observed. Rank 2 is “Students demonstrate logical reasoning in digital research”, with a weighted mean of 4.01 or Competent, which means that the level of students’ DQ competency as perceived by students and faculty members in terms of digital critical thinking competency is observed. Rank 3 is “Students analyze digital data effectively”, with a weighted mean of 3.87 or Competent, which means that the level of students’ DQ competency as perceived by students and faculty members in terms of digital critical thinking competency is observed. The lowest in rank is “Students can distinguish credible from unreliable information”, with a weighted mean of 3.35 or Moderately Competent, which means that the level of students’ DQ competency, as perceived by students and faculty members in terms of digital critical thinking competency, is limited. The overall average weighted mean is 3.83 (SD=0.325), or Competent, in the level of students’ DQ competency as perceived by students and faculty members in terms of digital critical thinking competency, is observed among the respondents.

Table 9. The Level of Students' DQ Competency As Perceived by Students and Faculty in Terms of Digital Communication Competency

Indicators	Weighted Mean	Interpretation	Ranking
Students communicate professionally through digital platforms.	4.00	C	2
Students collaborate effectively in online group work.	3.38	MC	5
Students observe proper digital etiquette.	3.90	C	3
Students present ideas confidently using digital tools.	3.82	C	4
Students use appropriate tone and language in digital communication.	4.20	HC	1
Average Weighted Mean	3.86	C	
Standard Deviation	0.303		

Legend: HC=Highly Competent, C=Competent, MC=Moderately Competent

Table 9 presents the weighted mean and the corresponding interpretation of the level of students' DQ competency as perceived by students and faculty members in terms of digital communication competency among the respondents.

It shows in the table that rank 1 is "Students use appropriate tone and language in digital communication", with a weighted mean of 4.20 or Highly Competent, which means that the level of students' DQ competency as perceived by students and faculty members in terms of digital communication competency is highly observed. Rank 2 is "Students communicate professionally through digital platforms", with a weighted mean of 4.00 or Competent, which means that the level of students' DQ competency as perceived by students and faculty members in terms of digital communication competency is observed. Rank 3 is "Students observe proper digital etiquette", with a weighted mean of 3.90 or Competent, which means that the level of students' DQ competency as perceived by students and faculty members in terms of digital communication competency is observed. The lowest in rank is "Students collaborate effectively in online group work", with a weighted mean of 3.38 or Moderately Competent, which means that the level of students' DQ competency, as perceived by students and faculty members in terms of digital communication competency, is limited. The overall average weighted mean is 3.86 (SD=0.303), or Competent, indicating that the level of students' DQ competency as perceived by students and faculty members in terms of digital communication competency is observed among the respondents.

Table 10 presents the weighted mean and the corresponding interpretation of the level of students' DQ competency as perceived by students and faculty members in terms of digital safety and security competency among the respondents.

Table 10. The Level of Students' DQ Competency As Perceived by Students and Faculty in Terms of Digital Safety and Security Competency

Indicators	Weighted Mean	Interpretation	Ranking
Students practice strong password management.	4.11	C	2
Students protect their personal information online.	3.89	C	4
Students are aware of cybersecurity risks.	3.35	MC	5
Students avoid unsafe websites and suspicious links.	3.91	C	3
Students understand digital privacy settings and controls.	4.21	HC	1
Average Weighted Mean	3.894	C	
Standard Deviation	0.332		

Legend: HC=Highly Competent, C=Competent, MC=Moderately Competent

It shows in the table that rank 1 is "Students understand digital privacy settings and controls", with a weighted mean of 4.21 or Highly Competent, which means that the level of students' DQ competency as perceived by students and faculty members in terms of digital safety and security competency is highly observed. Rank 2 is "Students practice strong password management", with a weighted mean of 4.11 or Competent, which means that the level of students' DQ competency as perceived by students and faculty members in terms of digital safety and security competency is observed. Rank 3 is "Students avoid unsafe websites and suspicious links", with a weighted mean of 3.91 or Competent, which means that the level of students' DQ competency as perceived by students and faculty members in terms of digital safety and security competency is observed. The lowest in rank is "Students are aware of cybersecurity risks", with a

weighted mean of 3.35 or Moderately Competent, which means that the level of students' DQ competency, as perceived by students and faculty members in terms of digital safety and security competency, is limited. The overall average weighted mean is 3.894 (SD=0.332) or Competent, indicating that the level of students' DQ competency as perceived by students and faculty members in terms of digital safety and security competency is observed among the respondents.

Is there a significant relationship between the level of DQ integration in institutional learning outcomes and students' academic performance?

Table 11 presents the test of the significant relationship between the level of DQ integration in institutional learning outcomes and students' academic performance.

Table 11. Test on the Significant Relationship between the level of DQ Integration in Institutional Learning Outcomes and Students' Academic Performance

Test of Variables on the significant relationship between the level of DQ integration in institutional learning outcomes and students' academic performance	Computed r value	Relationship	Decision
Digital Citizenship vs.			
Digital Citizenship Competency	0.0341263	Not Significant	Accepted
Digital Creativity Competency	0.0339060	Not Significant	Accepted
Digital Critical Thinking Competency	0.0341708	Not Significant	Accepted
Digital Communication Competency	0.0340397	Not Significant	Accepted
Digital Safety and Security Competency	0.0338888	Not Significant	Accepted
Digital Creativity vs.			
Digital Citizenship Competency	0.0335556	Not Significant	Accepted
Digital Creativity Competency	0.0333393	Not Significant	Accepted
Digital Critical Thinking Competency	0.0335994	Not Significant	Accepted
Digital Communication Competency	0.0334686	Not Significant	Accepted
Digital Safety and Security Competency	0.0333321	Not Significant	Accepted
Digital Critical Thinking vs.			
Digital Citizenship Competency	0.0336416	Not Significant	Accepted
Digital Creativity Competency	0.0334247	Not Significant	Accepted
Digital Critical Thinking Competency	0.0336854	Not Significant	Accepted
Digital Communication Competency	0.0335543	Not Significant	Accepted
Digital Safety and Security Competency	0.0334075	Not Significant	Accepted
Digital Communication vs.			
Digital Citizenship Competency	0.0338593	Not Significant	Accepted
Digital Creativity Competency	0.0336410	Not Significant	Accepted
Digital Critical Thinking Competency	0.0339035	Not Significant	Accepted
Digital Communication Competency	0.0337715	Not Significant	Accepted
Digital Safety and Security Competency	0.0336237	Not Significant	Accepted
Digital Safety and Security vs.			
Digital Citizenship Competency	0.0336848	Not Significant	Accepted
Digital Creativity Competency	0.0334676	Not Significant	Accepted
Digital Critical Thinking Competency	0.0337287	Not Significant	Accepted
Digital Communication Competency	0.0335974	Not Significant	Accepted
Digital Safety and Security Competency	0.0334504	Not Significant	Accepted

Note: One-tailed test, df of 60, at 0.05 the level of significance, with a critical value of 0.2500035

It shows in the table that when the two variables are tested from each other, it reveals that all the computed r values are lower than the critical r value of 0.2500035, df of 60, one-tailed test, with 0.05 the level of significance, which resulted in non-significance. Therefore, it is safe to say that there is no significant relationship between the level of DQ integration in institutional learning outcomes and students' academic performance as observed among the respondents.

The statistic used in the hypothesis testing is the Pearson Product-Moment Correlation r to measure the indices of the two variables on the level of DQ integration of institutional learning outcomes and student academic performance based on the analysis for the certified statistician of the institution.

4. DISCUSSION

It shows that the level of integration of DQ in institutional learning outcomes in terms of digital citizenship among the respondents emphasizes that institutional outcomes are responsible for social media and academic policies to promote respect and accountability in the digital environment. It has changed how digital technology works in the educational system, which utilizes civic school settings involved in society and responsible citizens. It utilizes civic education in the digital world of technology to ensure that digital tools are based on supporting learning, responsible, and right principles. It looks like the digital teaching method has changed in civic society to assist students in becoming better digital citizens, which is focused on values and learning approaches. It provides ideas and information on teaching values, government policies, and articles (Hidayatulloh et al., 2026). On the other hand, the level of integration of DQ in institutional learning outcomes in terms of digital citizenship integrates institutional responsibility for online behavior and its learning outcomes. This includes courses on ethical utilization and digital resources to guide students on digital responsibilities and rights. It develops the skills to identify sustainability, digital culture, and education in global citizenship. It enhances critical and personalized learning to articulate socio-environmental responsibility and articulating pedagogical innovation. It analyzes the impact of technology on global citizenship and competency development. It increases academic engagement, ecological awareness, inclusion, and digital technologies related to inequality, access, challenges, conceptual fragility, and institutional resistance. It represents a promising path in digital educational support and systematic transformation practices (de Carvalho et al., 2025).

Moreover, the level of integration of DQ in institutional learning outcomes in terms of digital creativity among the respondents shows that the curriculum encourages innovative use of digital tools, where faculty incorporate digital production tools in assessments and learning outcomes to promote creative problem-solving using technology. It aims to enhance the related digital creativity factors in a systematic review according to the guidelines of higher education institutions. It is a factor for advanced technology media, digital systems, and applications. This includes self-determination, motivation for mastery, self-efficacy, and mindfulness, learned through school organization, leadership, and the learning system. It is a technology of digital media factors for digital creativity and attention. Digital creativity discusses the thought and process of digital intelligence to generate ideas and usability (Wulan et al., 2025). Also, the level of integration of DQ in institutional learning outcomes in terms of digital creativity integrates courses to design through digital platform thinking, where students are required to create projects and tasks digitally. It analyzes the digital creativity evolution in defining the dynamic process to foster digital technology collaboration, automation, self-expression, and inclusion. It describes the new, valuable ideas, generation, solutions, or products of digital tools to combine socio-emotional skills and cognitive collaborative environments. It is the ability to understand and use intuition to make effective and quick decisions based on pattern recognition and prior experiences, playing a crucial role in the process of digital creativity. It highlights the impact of self-expression in educational exploration to solve issues in digital creativity (Samper-Márquez & Oropesa-Ruiz, 2025).

Furthermore, the level of integration of DQ in institutional learning outcomes in terms of digital critical thinking among the respondents shows that students are trained to evaluate online information critically, and courses develop ethical reasoning in digital contexts. It highlights the role of digital literacy, collaboration, and critical thinking in the classroom setting as perceived by students and lecturers as necessary for competency. It incorporates the skills needed due to a less flexible curriculum, lack of resources, and the predisposition of teachers to various issues. It implements activities for students' engagement, critical thinking, and performance related to digital intelligence and literacy. The digital critical thinking and collaboration involved teachers in demonstrating the needful and focused approach for resource distribution, curriculum change, and professional development for the students to prepare skills and success in an ever-changing pace of learning. It emerges that massive change, globalization, and technological demands in teaching techniques (Ullah et al., 2026). On the other hand, the level of integration of DQ in institutional learning outcomes in terms of digital critical thinking includes learning outcome utilization and data analysis for digital tools. It engages in the important implementation of digital learning necessary for effective instructional strategies. It provides significant attention to the critical thinking process and innovation tools for learning. It enhances the evaluation of student critical thinking and the learning outcome approach. It serves to integrate strategies in the innovative teaching demands of modern education. It is a fundamental endeavor in education to empower and foster students for interactive learning

and the potential for critical thinking of students. It transcends knowledge dissemination, acquisition, and learning to align with the competency and prioritizing character formation demands (Kumalasari et al., 2026).

Apparently, the level of integration of DQ in institutional learning outcomes in terms of digital communication among the respondents shows that students are assessed on their ability to communicate effectively online, where the institutions promote professional digital communication skills in fostering the acquisition of knowledge for self-directed learning necessary in the formal learning process. It increases the integration of digital communication, particularly in promising technologies in the sensory modalities of teaching. It develops a growing signal for digital communication maturity to enhance emotional and cognitive outcomes to support the potential function of the learning process. It offers the opportunity of an accessible classroom setting to explore the principles of digital communication as contributions of advanced technology (Moser et al., 2026). Certainly, the level of integration of DQ in institutional learning outcomes in terms of digital communication shows that learning outcomes emphasize digital etiquette, where students are trained in collaborative digital platforms. It examines the digital role and core strategic mechanisms in the HEI to influence institutional branding and engagement. It adopts the approach of teaching digital communication activities for student branding and engagement. It integrates diverse methodological contexts and implications of strategies, explanatory mechanisms for digital communication through a driven program of core graduate studies in the HEIs. Student engagement translates into activities to play in producing quality graduates and communication competency skills. It indicates platform, authenticity, content quality, strategy function, and effectiveness (Abbas, 2026).

Indeed, the level of integration of DQ in institutional learning outcomes in terms of digital safety and security among the respondents shows that policies promote safe and secure digital learning environments where the institutions integrate cybersecurity awareness into their curriculum. Integrating cybersecurity into the system of education system is possible to change behaviors from good, better, and best in structuring curricula for spreading digital safety and security and teacher training policies. The approach is related to teaching strategies that should be examined for cybersecurity on a global scale. Trends and practices assess the limits of digital safety and security awareness and behavioral change in the educational setting. The institutional framework needs to empower pedagogical actors with adequate support in the delivery of digital safety and security effectively (Kandır & Uğur, 2025). Notably, the level of integration of DQ in institutional learning outcomes in terms of digital safety and security shows that students are taught how to protect personal data online. They are trained to recognize phishing, scams, and cyber threats. It forecasts the perception of a multidimensional security system for students to engage in vulnerable transitional society evaluation of security in everyday life. It examines the various dimensions of digital safety and security, such as policies, trust in the community or institutions, crises, perception of emergencies, digital privacy and security, perceived national threats, demonstrations, safety, public events, and personal safety. It offers design and valuable insights on the targeted risk, institutional reform, and inclusive policy initiatives. It aims to contribute to participatory security, civic trust, resilience, and security governance in the context of social sustainability (Cvetković et al., 2025).

Certainly, the level of students' DQ competency, as perceived by students and faculty members in terms of digital citizenship competency among the respondents, shows that students are aware of digital laws and regulations. They are engaged positively in online communities. Technology has emerged beyond technology. The competencies are necessary to navigate ethically, responsibly, and safely in the community. It is a well-designed core school strategy in the curriculum program to enhance students' learning competency outcomes regarding digital citizenship. It indicates that the digital citizenship competency concept and integration in identity education are part of the improvement framework. It categorizes the digital citizenship framework as a core competency for responsible utilization, ethical participation, and digital safety (Un, 2025). Consequently, the level of students' DQ competency as perceived by students and faculty members in terms of digital citizenship competency shows that students demonstrate responsible behavior online, where they are being respected for their intellectual property rights. It introduces the pedagogical model and context sensitivity to integrate digital competency and legal culture, piloted and developed in higher education institutions. It responds to the modernized and urgent needs to embed the legal digital citizen competency, such as a legal training framework, data ethics, and legal education. It addresses institutional barriers persistent toward educational technology. It addresses and suggests

challenges as evidence-based interventions, such as development initiatives and faculty training. It offers a flexible model and validated traditional practice in the educational system (Ergasheva et al., 2025).

In contrast, the level of students' DQ competency, as perceived by students and faculty members in terms of digital creativity competency among the respondents, shows that students can create digital content independently, where they can adapt digital tools to solve academic problems. It transforms the digital technology and creative industry. It emerges through the application of digital creativity competency tools in various platforms and contexts. It expands creativity boundaries on integral digital technology as to creative work, industry, and academic programs for curriculum in the HEI and core components. It evolves with digital techniques and the landscape in the educational system. It examines the demands of digital creativity competency to utilize effective integration practices for professional development and critical components (Lim & Zahari, 2025). In addition, the level of students' DQ competency, as perceived by students and faculty members in terms of digital creativity competency, shows that students use technology innovatively in projects where they apply design and creativity in digital tasks. It establishes transformational potential knowledge on emerging digitalization measures to be imposed on digital creativity competency elaboration and demands in the educational system. It highlights the skills of the learners and their roles in bridging the gaps and framework of digital intelligence through creativity and competency. It proposes a strategy roadmap for future skills and humanity in higher education institutions. It provides policy-making and actionable recommendations for the digital creativity competency program. It introduces various digital skills and applications for the professional dimension of the professional communication process (Makhachashvili & Shtaltovna, 2025).

Furthermore, the level of students' DQ competency as perceived by students and faculty members in terms of digital critical thinking competency among the respondents shows that students critically evaluate online sources where they demonstrate logical reasoning in digital research. It encompasses digital intelligence and literacy for critical thinking, as well as values, skills, knowledge, and competency that enables effectively on the utilization of communication and digital information technology activities. It describes self-assessment and development for teachers and students regarding digital critical thinking. It adopts the digital literacy skills, common framework, and readiness in addressing critical thinking competency as to rights, literacy, communication, emotional intelligence, security, safety, utilization, and identity (Branco et al., 2025). Also, the level of students' DQ competency as perceived by students and faculty members in terms of digital critical thinking competency shows that students analyze digital data effectively, where they can distinguish credible from unreliable information. It is the basis for digital intelligence development to assist students regarding digital critical thinking in terms of digital rights, literacy, emotional intelligence, security, safety, utilization, and identity dimensions. It assesses the digital intelligence and critical thinking of students' development in technology in teaching and learning among core graduates in the Higher Education Institutions. It provides intelligent guidance for digital innovation and integration. Digital critical thinking has become a core requirement and competency for students in various applications at hand. It maps the information literacy and development of digital intelligence in relation to the critical thinking process (Li et al., 2024).

Hence, the level of students' DQ competency as perceived by students and faculty members in terms of digital communication competency among the respondents shows that students use appropriate tone and language in digital communication, where they can communicate professionally through digital platforms. It explores the digital intelligence for teachers' efficiency, school performance, and students' learning outcomes. It incorporates digital technology to increase comprehension and influence of the instructional process in the school setting. It indicates that digital intelligence provides a high level of communication to demonstrate digital literacy and security. It displays proficiency for teachers and students' engagement in the implementation of digital communication competency in classroom management and instructional strategies. It assesses the digital communication competency for teacher and student efficacy on digital intelligence (Platon & Astillero, 2025). Apparently, the level of students' DQ competency, as perceived by students and faculty members in terms of digital communication competency, shows that students observe proper digital etiquette and collaborate effectively in group work. It determines the digital intelligence for work readiness of graduate students and competency. It indicates that core graduate students in HEIs tend to demonstrate readiness for work due to their competency in the communication process. It mediates substantial digital intelligence in communication competency. It emphasizes that technical communication competency and skills are focused on student digital intelligence as part of the program

and curriculum in the educational system. It highlights the fundamental traits of digital communication competency in embracing optimal technology in the workplace, among them (Pham & Dau, 2024).

Lastly, the level of students' DQ competency as perceived by students and faculty members in terms of digital safety and security competency among the respondents shows that students understand digital privacy settings and controls, where they can practice strong password management to be free from any untoward hacking and scams on social media, which is very rampant at present. It focuses on media literacy and the emergence of digitalization that has become more prevalent in embracing innovation for safety and security practices, forcing educators to use digital technologies. It measures and develops digital literacy with a focus on safety and security competency in terms of values, skills, and knowledge. It adopts the framework of digital intelligence relevant to the instrument and assessment utilized by the HEI. The digital safety and security competency is holistic, complex knowledge in a diverse digital-mediated environment (Ahmad Tajuddin et al., 2024). Finally, the level of students' DQ competency as perceived by students and faculty members in terms of digital safety and security competency shows that students and faculty avoid unsafe websites and suspicious links where they are aware of cybersecurity risks. It focuses on examining the reliability and validity of digital intelligence in public safety and security. It shapes the rapid advancement of technology for digital intelligence in various devices, integral components in utilizing safety and security in the educational experiences of the respondents. It enriches a wider communication network and information to transform the devices in the learning process of individuals. Digital safety and security introduce a wider digital world. It increases exposure in the digital world day by day (Ünal & Kandır, 2026).

5. CONCLUSION

It shows that the level of integration of DQ in institutional learning outcomes in terms of digital citizenship emphasizes responsible engagement for social media to promote academic policies such as respect and accountability in a digital form. This includes the responsibility of institutional integration for learning outcome behavior. It shows that digital creativity reveals curriculum utilization of digital tools and innovation for the assessment of faculty in digital production. This includes the promotion of learning outcomes and problem-solving technology. It shows that digital critical thinking indicates that students are trained to think critically for evaluation of teaching and learning through course development in a digital context and ethical reasoning. This includes data analysis in utilizing digital tools for learning outcomes to identify fake news and misinformation. It shows that digital information indicates students are being assessed on their capacity and ability to communicate effectively, as it is being promoted by the institutions professionally for effective digital communication skills. This includes digital etiquette, with emphasis on learning outcomes for collaborative digital platforms. It shows that digital safety and security indicate policies to be promoted where the institutions integrate awareness of cyberbullying in the curriculum. This includes the protection of personal data in recognizing cyber threats, scams, and phishing.

On the other hand, the level of students' DQ competency as perceived by students and faculty members in terms of digital citizenship competency shows that students are aware of regulations and digital laws where they are engage optimistic in online communities. This includes demonstrating responsible online behavior with respect to intellectual property rights. It shows that digital creativity competency enables students to enhance content and create digital content independently to solve academic issues in digital tool processes. This includes innovation of projects in utilizing technology for digital tasks, creativity, and the application of design. It shows that digital critical thinking competency indicates that students critically evaluate online sources to demonstrate digital research and logical reasoning. This includes the analysis of data and digital information effectively in distinguishing unreliable information and credibility. It shows that digital communication competency indicates that students utilize appropriate language and tone in digital communication professionally through advanced technology platforms. This includes observing digital etiquette for group work and collaboration to learn effectively. It shows that digital safety and security competency indicates that students understand digital settings, privacy and control, and that students practice the management of strong passwords. This includes avoiding suspicious links and being aware of cybersecurity risks.

Furthermore, the practical implication of DQ as a core graduate attribute in higher education prepares students and serves a vital significant for the challenges and opportunities of the digital age. It is integrated into educational institutions as a significant implication for educational policy, institutional

leadership, and curriculum innovation in teaching and learning. It is embedded in the DQ within institutional frameworks, academic programs, ethical higher education institutions, responsible graduates, and cultivates digitally competent individuals who are capable of contributing to sustainable development meaningfully, societal advancement, and workforce readiness.

6. RECOMMENDATION

Digital citizenship must be integrated in higher education institutions for better competencies for both students and faculty members, as well as promoting responsible, respectful behavior in learning institutional outcomes in a digital environment where faculty members need to inject discussions on academic integrity, intellectual property rights, discussions on digital ethics, and responsible social media utilization, engagement, and digital platforms.

Digital creativity must be designed by the curriculum developers to encourage learning activities for both faculty and students in the utilization and innovation of tools, problem-solving, and content creation, where HEIs must provide access to creative software, digital laboratories, and multimedia technologies that support and enhance the development of skills in digital creativity.

Digital critical Thinking must be embedded in all disciplines for critical information evaluation to strengthen both faculty members' and students' ability to identify evidence-based digital-era resources, reliability, and credibility, where the faculty development program includes fact-checking, data analysis, training in information literacy, and the ethical usage of artificial intelligence technologies.

Digital communication must be integrated in school institutions for competency learning outcomes and competencies to prepare students for academic, global interaction, and professionalism, where faculty members must be the model of digitally appropriate communication practices through the utilization of systems for learning management, professional platforms, and virtual collaboration tools to provide students with engagement and opportunity for webinars, presentations, and virtual teamwork.

Digital safety and security must be strengthened by higher education institutions for educational programs and institutional policies related to digital risk management, privacy protection, and cybersecurity, where it must be mandatory to provide training on digital security and safety, responsible technology, data privacy, password management, and cyber threat awareness to both faculty members and students.

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Research Ethics. The study adheres to the research ethics standards from the start to the end of the writing process for the protection of the participants' safety, dignity, rights, and well-being. It is conducted based on the protocols of research principles and ethics.

Data Availability Statement. The data are available from the corresponding authors to support the findings of the study. Owing to institutional policies, ethical considerations, and the need to protect confidentiality and privacy, the dataset is not available publicly. The collected data from the participants are not unrestricted for public access, which may compromise the anonymity of the respondents.

Conflicts of Interest. The research was conducted objectively and independently with accepted standards of scholarly integrity and ethical principles. No individual, funding agency, organization, or institution exerted undue influence over the process of research, interpretation of findings, data analysis, data collection, or preparation of the manuscript. The authors affirm that respondents were treated equitably and fairly throughout the research process. Permission from the institutions was obtained for the conduct of the study and not to influence the research findings or conclusions.

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